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unrivalled appliances for the production of intense cold, as well as of the assistance of Professor Dewar. An account of the experiments is given in the *Comptes Rendus*, and with notes by Professor Crookes in the *Chemical News* of June 11th. The difficulties encountered in the liquefaction of fluorin are its intensely corrosive action and its very low temperature. Several liters of liquid oxygen, the refrigerant, were used in the research. Happily, at very low temperatures fluorin loses much of its chemical activity, no longer attacking glass. Fluorin becomes liquid at -185° C., is clear yellow and possesses great mobility. At this low temperature silicon, carbon, sulfur, phosphorus and reduced iron previously cooled in liquid oxygen and then placed in an atmosphere of fluorin, do not become incandescent, and the iodine of potassium iodide is not displaced by fluorin. Benzene and turpentine are, however, decomposed with incandescence when the temperature rises to -180° C., showing the great affinity of fluorin for hydrogen. Note is made of the fact that when fluorin is passed through liquid oxygen a white flocculent precipitate is formed, which when filtered off deflagrates with great violence as soon as the temperature rises. It would seem to be a compound of fluorin and oxygen, and is being further investigated.

In a recent *Comptes Rendus*, Berthelot and Vieille give an account of further investigations on the dangers attending the storage of acetylene. They had previously shown that, if under less than two atmospheres pressure, acetylene cannot be detonated by fulminates or by red-hot wire. They now show that acetone is a good solvent for acetylene. While such a solution is still capable of explosion, it is much safer than the gas alone, and the pressure at which an explosion is possible is raised from two to ten kilograms per square centimeter. In a large vessel the amount of

acetylene that can be safely stored is fifty times greater with the acetone than without it.

At the conference of the Institution of Civil Engineers, held in London the last of May, Professor Biles read a paper before the Shipbuilding Section on 'Improved Materials of Construction.' In the course of the discussion which followed it was strongly brought out that nickel steel is the coming material for shipbuilding, provided its cost can be made satisfactory. For this, it was said that new deposits of nickel must be discovered and the cost of its metallurgy must be reduced.

THE *Engineering and Mining Journal* gives a report of the Carborundum Company for 1896, by which it appears that the output of crystalline carborundum for last year was nearly six hundred tons. It seems probable that the amorphous carborundum formed in the manufacture, which has heretofore had no use, will ultimately displace ferro-silicon in the manufacture of steel. Germany alone would use 2,500 tons of carborundum annually if it could be furnished at not over six cents a pound, and the Carborundum Company claims it can do this.

J. L. H.

SCIENTIFIC NOTES AND NEWS.

WE are informed that the preliminary programs for the meetings of the sections of the American Association for the Advancement of Science promise many interesting papers and a large attendance. No less than twenty-five papers have already been entered to be read before the physical section, including contributions from a number of leading physicists, and other sciences will be equally well represented. We hope to publish in advance of the meeting the full programs for all the sections.

THE fourth summer meeting of the American Mathematical Society will be held, as we have already announced, at Toronto, Canada, on Monday and Tuesday, August 16th and 17th.

It will thus immediately follow the adjournment of the American Association for the Advancement of Science from Detroit to Toronto, and immediately precede the opening of the Toronto meeting of the British Association for the Advancement of Science. The committee of arrangements announce that by invitation of the University of Toronto the Society will meet in the main building of the University. The Society will be called to order by the President, Professor Simon Newcomb, on Monday morning at 10 o'clock, and the Council will meet Monday evening. The committee has decided to set apart one of the sessions during the meeting for the general discussion of the following subjects: (1) The accurate definition of the subject-matter mathematics. (2). The vocabulary of mathematics. The possibility of correcting and enriching it by cooperative action. In connection with the former of the subjects, reference may be made to the Presidential address of Mr. A. B. Kempe before the London Mathematical Society (Proceedings of the London Mathematical Society, Vol. 26, pp. 5-15). No special railroad rates to and from this meeting have been secured, but members are entitled to special rates for the numerous excursions arranged in connection with the meeting of the British Association. Members may join the British Association on payment of five dollars. Members of the American or of the British Association secure reduced rates to and from the meeting through those bodies.

MR. C. L. MARLATT, Secretary of the Association of Economic Entomologists, writes us that the annual meeting of the Association for 1897, which was announced for the two days preceding the general sessions of the American Association for the Advancement of Science at Detroit, viz., August 6th and 7th, has arranged for its sessions on Thursday and Friday, August 12th and 13th, during which time Section F will hold no meetings, closing its work on Wednesday, the 11th. It is believed that this arrangement will give better satisfaction to the members of the Association of Economic Entomologists, most of whom are also members of Section F, and will be a saving of time. The Russell House will be headquarters. A new feature of interest which will be introduced this year will

be reports from various foreign members of the Association on the worst insect pests of the year in their respective countries. The titles of papers should be sent promptly to the Secretary to be inserted in the provisional program. General information relating to hotel accommodations, railroad rates, etc., is given in the preliminary announcement recently issued by the American Association for the Advancement of Science, and, if any of the members have not received this circular, they may obtain it, or any other desired information of similar nature, by writing to the Local Secretary, A.A.A.S., Mr. John A. Russell, 401 Chamber of Commerce, Detroit, Mich.

AMONG the very numerous jubilee honors conferred by Queen Victoria we notice that Sir William MacCormac, President of the Royal College of Surgeons; Dr. Samuel Wilks, President of the Royal College of Physicians, and Mr. James Pender, who carries on much of his father's work in connection with telegraphs, have been made baronets. Professor William Crookes, Dr. W. G. Gowers and Dr. Felix Semon have been made knights. The K. C. B. has been conferred upon Professor J. Norman Lockyer, Dr. William Huggins, Mr. J. Wolfe Barry and Dr. Edward Frankland, and the C. B. on Mr. W. H. M. Christie, Astronomer Royal.

YALE University has conferred the degree of LL.D. on Dr. T. Mitchell Prudden, professor of pathology in Columbia University.

HARVARD University has conferred the degree of A.M. on Professor Franklin W. Hooper, of the Brooklyn Institute of Arts and Sciences.

TRINITY University, of Toronto, will confer, at the approaching meeting of the British Association, the honorary degree of D.C.L. on Sir John Evans, President; Lord Lister, Lord Rayleigh, Sir John Lubbock and Dr. Forsyth.

MR. ERNEST B. FORBES, of the University of Illinois, has been appointed Assistant State Entomologist in Minnesota.

F. V. COVILLE, Chief Botanist of the Department of Agriculture and Curator of the National Herbarium, has just gone to Oregon, to investigate the effect of sheep herding on the vegetation of the Cascade Range, and to conduct botanical investigations.

A DISPATCH to the London *Times* states that Lieutenant Eldred Pottinger and Mr. Lawrence, who, with a small party of Gurkhas, have been engaged for some months past in exploring the sources of the Irawadi, were attacked by Black Mairus on the night of May 22d. A native surveyor and one Gurkha were killed, and two Gurkhas were wounded. Lieutenant Pottinger and Mr. Lawrence escaped with the rest of the party, bringing the wounded men with them, and after great hardships arrived in Chinese territory.

THE death is announced of Dr. Japetus Steenstrup, formerly professor of zoology at the University of Copenhagen, and known for his contributions to natural history and paleontology, at the age of eight-four.

THE trustees of the National Portrait Gallery, London, have purchased a portrait of Sir Joseph Richardson, sometime British Secretary of State and the second President of the Royal Society. The Gallery has received by presentation a portrait of Francis Ronalds, one of the inventors of the electric telegraph, and a bust of Richard Jeffries, naturalist and author.

A BRONZE statue of Benjamin Franklin, representing Franklin seated in heroic proportions, will be presented to the City of Philadelphia by Mr. Justice C. Strawbridge and erected on the spot where Franklin laid the cornerstone of the first building of the University of Pennsylvania.

THE committee on an international memorial to the late Sir John Pender, whose appointment we announced some time since, has already received subscriptions amounting to about £6,000. It is proposed to place a bust of Sir John Pender in some suitable institution, to endow with £5,000 a Pender chair of electrical engineering in University College, London, and to establish a Pender scholarship and a gold medal at Glasgow University.

MR. JOHN RUSSELL YOUNG, a newspaper correspondent, not known to have made any study of library management or methods, has been appointed by President McKinley head of the new Congressional Library. Mr. A. R. Spofford will remain connected with the library as First Assistant Librarian. Mr. Bernard

R. Green, who, with the late General Thomas L. Casey, supervised the construction of the library building, has been appointed Superintendent of the Buildings and Grounds.

SECRETARY SHERMAN has, under an authorization in the recent sundry civil appropriation bill, changed the title of the Bureau of Statistics of the State Department to that of Bureau of Foreign Commerce. The old title tended to confusion with other bureaus and did not properly describe the work of the bureau, which deals with the collection of reports of consular officers on foreign commerce and their distribution to the business community.

A COMMITTEE has been appointed by the Treasury Department to make an investigation of the U. S. Coast and Geodetic Survey, with a view to learning whether the efficiency of the department, especially its field work, can be improved. Professor W. G. Raymond, of the Rensselaer Polytechnic Institute, and Mr. Octave Chanute, of Chicago, have been appointed members of the committee, one place remaining to be filled.

THE New York Zoological Society has begun the publication of a *News Bulletin*, intended to increase interest in the work of the Society. The first number contains, in addition to items of news, an illustrated article on the Zoological Park, reprinted from *Harper's Weekly*. The Society proposes to hold, next winter, an exhibition of paintings and sculptures of American wild animals. The plan for the grounds and buildings of the park will soon be completed.

THE specifications for the new wing of the American Museum of Natural History, New York, have been approved by the Park Board, and bids for the building will soon be opened.

THE Natural History Building of the University of Illinois was struck by lightning on the morning of June 17th, and partially destroyed. The collections, apparatus and libraries of the Illinois State Laboratory of Natural History, the Biological Station and the Agricultural Experiment Station were saved, with slight damages by water. The damage to the building is estimated at \$3,000. The loss in apparatus, principally in geological and botanical departments, is nearly \$5,000.

THE steamship Hope, commanded by Captain John Bartlett, has been again chartered by Lieutenant Peary, who will leave Boston to join the steamship between July 10th and 12th.

THE daily papers state that additional details of the eruption of the Mayou volcano, in the Province of Albany, Philippine Islands, show that 120 of the inhabitants of the village of Liboug perished. The village was greatly damaged and the tobacco crop of the vicinity was destroyed. The eruption was accompanied by an earthquake, the shocks being felt over an area of one mile. The volcano of Mayou has not been active since 1617.

THE third session of the Greenacre lectures opened on July 1st and will continue until September 3d. Daily lectures are given on subjects of scientific, literary and philosophical interest. The congress will take advantage of the meeting of electrical engineers at Greenacre and announces as part of the program lectures by Professors Barker, Brackett, Duncan, Crocker, Pupin, Cross and others.

THE International Institute of Bibliography at Brussels announces the holding of its second conference, August 2-4, 1897.

THE *American Journal of Archæology*, hitherto edited by Professor A. L. Frothingham, Jr., has been transferred to the Archæological Institute of America, and will hereafter be published in a second series by the Macmillan Company. Professor John H. White, of Harvard University, will be the editor-in-chief, with Professor James R. Wheeler, of Columbia University, and Professor Allan Marquand, of Princeton University, as assistant editors.

DR. PERSIFOR FRAZER, who, at the wish of the late Professor Cope, has been for two months acting as managing editor *pro tem.* of the *American Naturalist*, has been succeeded temporarily by Mr. A. M. Brown, of Philadelphia.

Natural Science calls attention to the fact that over a century ago there was founded a zoological record, viz., F. A. A. Meyer's *Zoologische Annalen*, which was published at Weimar in 1794, and ran for one year only. Meyer gave an account of zoological works issued up to Easter and up to Michaelmas, 1793, an alphabet-

ical list of all living zoologists, an account of all the zoological collections known to him, and a sketch of all the new animals described during the year, in systematic order.

MR. A. W. BENNETT will succeed Professor F. J. Bell as editor of the Journal of the Royal Microscopical Society.

A *Zeitschrift für comprimirt und flüssige Gase*, edited by Dr. M. Altschul, will hereafter be published in Berlin by L. Esterman. The first number was opened by an article by Professor Raoul Pictet, followed by articles by Professor H. F. Wiebe and Professor M. Thiesen.

IT is noted in *Industries and Iron* that according to a recent American Consular report, at a place called Tongshan, about eighty miles from Tien-tsin, the Chinese have established extensive railway carriage building works, in which the rolling-stock for the extension of the railway is being constructed. Only the axles, wheels, springs and couplers are imported, and the Consul expresses himself as surprised at the excellence and finish of the passenger carriages turned out by native labor. The Chinese Engineering and Mining Company have attained an output of 2,000 tons of coal daily from the mines in the vicinity, and large extensions are being contemplated.

WE have already announced that next year Captain Sverdrup proposes to take the Fram up Smith Sound to the northwest coast of Greenland, for the purpose of prosecuting explorations in that direction. The London *Times* states that, though Dr. Nansen will not accompany the party, there is reason to believe that he is taking an active share in the direction of the expedition. The object will be to penetrate north through Smith Sound and Robeson Channel as far as possible along the northwest coast of Greenland. An attempt will be made to discover how far Greenland extends northward, and to survey the northwest, north and northeast coasts. In short, one prime object will be to complete the exploration of the Greenland coast, a considerable extent of which is still quite unknown. It will be remembered that Lieutenant Peary carried explorations further eastward than had been previously

done. The task will be a difficult one, even if Captain Sverdrup succeeds in taking the Fram through the difficult ice navigation which is generally found between the Greenland and American shores. Still, as we know from Hall's experience, there are years when the passage is quite clear, and if the conditions are favorable the Fram may succeed in reaching 82° N. without difficulty. Dr. Nansen is also anxious that Captain Sverdrup should examine what has been called the 'paleo-crystic ice,' about which there has been so much discussion, and as to the origin and real character of which there is considerable doubt. An attempt will be made to discover how far one must travel from land with dogs and sledges before meeting with ice more like that in which the Fram drifted.

COMMISSIONER HERRMANN, of the General Land Office, has formulated, for the approval of the Secretary of the Interior, Regulations for the Forestry Reserves of the United States, following the recommendations of the Committee of the National Academy, published in a recent issue of this JOURNAL. Attention is called to the danger of forest fires and to the law providing for punishment by fine or imprisonment, not only for willfully setting fire to any timber on the public domain, but also for letting fires burn unattended near any timber. The recommendations would allow prospecting and the development of mineral resources, and land for school houses and churches are provided. The construction of wagon roads and irrigating canals is permitted. The pasturing of live stock is allowed, except of sheep in regions where the rain fall is limited. Owners of mines and settlers resident within the forest reserves are permitted to take firewood, fencing and building material when they have not a sufficient supply on their own claims. Provision is also made for the sale of timber when this will not interfere with the value of the forests. Instructions are issued to all special agents of the Interior Department regarding the prevention of injury and depredations. It is further provided that lands more useful for mining or agricultural purposes may be eliminated from the forest reserves and restored to the public domain. Subject to the surveys now being

made by the Geological Survey, portions of the suspended reserves may be restored to public entry, and other portions of the public domain may be included in them.

AN article in the London *Times* entitled 'On the Trail of a Ghost,' regarding an alleged haunted house in Perthshire, Scotland, has been followed by numerous letters on the subject. Two of these, one by Professor John Milne, offer the plausible explanation that the noises are of seismic origin. Perthshire is a center for British earthquakes. As early as 1840 the British Association appointed a committee to investigate the Perthshire earthquakes, and instruments were established in the parish church at Comrie. As many as 465 shocks were noted there between 1852 and 1890, and sounds may be heard when no movement can be either felt or recorded by an ordinary seismograph. Mr. Milne suggests that "The Society for Psychical Research when on bogey-hunting expeditions might possibly find that the suggested use of tromometric apparatus might not only lay home-made ghosts, but would furnish materials of value to all who are interested in seismic research."

WE learn from *Industries and Iron* that the Lachine Rapids, Hydraulic and Land Company, organized in 1895, to use the great energy of the Lachine Rapids, near Montreal, will soon complete its installation. There will be about eighty-six turbine wheels shortly in operation, and twelve dynamos making 175 revolutions each with a generating pressure of 4,400 volts. The electric energy will be carried by overhead wires as far as the outskirts of Montreal, and then passed underground until it reaches the substation in the city.

THE supply bill passed at the recent session of the New York Legislature contained an item appropriating \$10,000 for the medical department of the University of Buffalo to investigate the causes, nature and treatment of cancer. Governor Black vetoed this appropriation with the statement: "I cannot approve a proposed policy which requires the State to engage in an investigation of the causes of various diseases with which the human family is afflicted. I think that the interest of the people themselves

and the skill, intelligence and enterprise of physicians may be depended upon to make an investigation."

THE laboratory courses in biology at Wesleyan University will be conducted next year by Mr. Estin during the absence of Professor Conn in Europe.

THE Berlin correspondent of the London *Times* writes that, at the recent Medical Congress, Professor Liebreich, who may, perhaps, be described as the leader of the anti-Koch party in the Berlin scientific world, stated his theory of tuberculosis as opposed to Professor Koch's. Phthisis, he said, might be present without tuberculous bacilli as concomitants. The reception of tuberculous bacilli into the system had an injurious effect only in cases where there existed a predisposition to disease, and thus the bacilli were only parasites. It was a radically false method to attempt merely to deliver a consumptive patient from the presence of bacilli. The chief thing was to increase the vital power of the cellular tissue. Cantharidine was a specific capable of producing this result. Was there any method of disinfecting the cellular system? In Professor Liebreich's experience he found that etherized oil of mustard had this effect. The lecturer did not think that the therapeutic systems which had been built up on the basis of bacteriology were defensible. The results obtained with diphtheritic serum were apparent rather than real. Professor Koch's method of treating tuberculosis had no prospect of ultimate success. Professor Liebreich's views were summarized in the sentence: "Tuberculosis is a 'nosoparasitism,' and the essential feature of the disease is the deterioration of the organism." Several subsequent speakers of eminence strongly combated Professor Liebreich's assertions, urging in particular the indubitable successes obtained with diphtheritic serum.

UNIVERSITY AND EDUCATIONAL NEWS.

THE Hull Biological Laboratories of the University of Chicago were formally dedicated on July 2d. The presentation was made by Miss Helen Culver and the acceptance

acknowledged by the President. The dedicatory address was made by Professor William H. Welch, of the Johns Hopkins University, his subject being 'Biology and Medicine.' The laboratories were open to inspection in the afternoon. A dinner was given to the visiting biologists before Professor Welch's address and a reception was given afterwards by the members of the biological faculties to Miss Culver and Professor Welch.

THE University of Chicago will erect a new building outside the University grounds which will contain the plant for power, light and heat, the extensive printing and bookbinding establishment and a retail bookselling and stationery department.

THE trustees of the College of the City of New York have approved the purchase of a site on Convent Avenue, and have authorized the executive committee to select plans for the buildings.

PRESIDENT G. J. KOLLEN, of Hope College, situated at Holland, Mich., announced at the recent commencement that \$100,000 had been subscribed for the College by various donors.

By the will of the late Dr. John T. Atwater, of Poughkeepsie, N. Y., Yale University receives land valued at \$25,000.

THE Ohio Supreme Court has handed down a decision that gives the Ohio State University the estate left by the late Mr. Henry F. Page, consisting of farms and personal property, the exact value of which is not known.

THE Thirty-fifth University Convocation of the State of New York met at Albany from the 28th to 30th of June, with a large attendance of those interested in higher education. Addresses were made by Chancellor Upson, Governor Black and President Canfield, of the Ohio State University. The first morning was devoted to the teaching of science, papers being presented on the 'Present Trend of Geography,' by Professor W. M. Davis, Harvard University; on 'Methods of Teaching Botany in the Secondary Schools,' by Professor Geo. F. Atkinson, Cornell University; on 'The Proper Use of Library and Laboratory in Teaching Physical Science in